

HP StorageWorks

4000/6000/8000 Enterprise Virtual Array connectivity for OpenVMS installation and reference guide

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About this guide

This installation and reference guide provides information to help you:

- Connect your host to an Enterprise Virtual Array storage systems
- Get pointers to the latest layered applications used with the Enterprise Virtual Array

“About this guide” topics include:

- [Overview](#)
- [Getting help](#)
- [Conventions](#)

Overview

- [Intended audience](#)
- [Related documentation](#)

Intended audience

This guide is intended for use by storage administrators who are experienced with the following:

- Host environments, such as Windows® 2000, Windows NT® , Windows Server 2003, Sun Solaris, OpenVMS, Tru64 UNIX®, HP-UX, IBM AIX, Linux®, Novell NetWare
- Enterprise Virtual Array (4000 / 6000 / 8000) storage systems

Related documentation

In addition to this guide, HP provides the following corresponding information:

- *HP StorageWorks 4000/6000/8000 Enterprise Virtual Array connectivity for OpenVMS release notes*
- *HP StorageWorks Storage System Scripting utility reference guide*
- *HP StorageWorks Interactive Help for Command View EVA*

Conventions

Conventions consist of the following:

- [Document conventions](#)
- [Text symbols](#)

Document conventions

This document follows the conventions in [Table 1](#).

Table 1 Document conventions

Convention	Element
Medium blue text: Figure 1	Cross-reference links and e-mail
Medium blue, underlined text (http://www.hp.com)	Web site addresses
Bold font	<ul style="list-style-type: none">• Key names• Text typed into a GUI element, such as into a box• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none">• File and directory names• System output• Code• Text typed at the command-line
<i>Monospace, italic font</i>	<ul style="list-style-type: none">• Code variables• Command-line variables
Monospace, bold font	Emphasis of file and directory names, system output, code, and text typed at the command line

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:



CAUTION:

Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.



NOTE:

Text set off in this manner presents commentary, sidelights, or interesting points of information.

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: <http://www.hp.com>.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: <http://www.hp.com/support/>. From this web site, select the country of origin.



NOTE:

For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage web site

The HP web site has the latest information on this product, as well as the latest drivers. Access storage at: <http://www.hp.com/country/us/eng/prodserv/storage.html>. From this web site, select the appropriate product or solution.

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the HP web site for locations and telephone numbers: <http://www.hp.com>.

1 Host connectivity

This chapter provides host connectivity information and links to components you need to support your operating system with an Enterprise Virtual Array storage system. It is important that you use the topics in this chapter in the following order:

- Installing the Fibre Channel adapter
- Downloading Fibre Channel adapter firmware
- Updating the Alpha SRM and Fibre Channel HBA firmware
Verifying Fibre Channel adapter software installation
- Using the Storage System Scripting utility
- Console LUN ID and OS unit ID
- Working with clusters

Installing the Fibre Channel adapter

Supported Fibre Channel adapters must be installed in the host server in order to communicate with the Enterprise Virtual Array. Because the Enterprise Virtual Array requires a multiple-path environment, a minimum of two FCA ports are required for each host.



NOTE:

Traditionally, the adapter used to connect the host server to the fabric is called a host bus adapter (HBA). The server HBA used with the Enterprise Virtual Array is called a Fibre Channel adapter (FCA). You may also see the adapter referred to as a Fibre Channel host bus adapter (FC HBA) in other related documents.

Follow the hardware installation rules and conventions for your server type. The Fibre Channel adapter is shipped with its own documentation for installation. Refer to that documentation for complete instructions.

You need the following items to begin:

- FCA boards and the installation instructions included in the adapter kit
- CD image to install the FCA firmware
- The server's hardware manual for instructions on installing adapters
- Appropriate tools to service your computer

The FCA board plugs into a standard PCI slot in the host server. Refer to the hardware manual for instructions on plugging in boards.

Downloading Fibre Channel adapter firmware

Supported Fibre Channel adapters (FCAs) must be installed in the host server in order to communicate with the Enterprise Virtual Array. You can download the latest version of the Fibre Channel adapter software at the following web site:

<http://h18006.www1.hp.com/storage/saninfrastructure.html>.

The ISO image for FCA firmware/Alpha system firmware (v6.9 or later) is available at:

<http://ftp.digital.com/pub/DEC/Alpha/firmware/index.html>

Refer to the host-specific release notes for a list of supported Fibre Channel adapters.

Updating the Alpha SRM and Fibre Channel HBA firmware

Use the following procedure to update the Alpha SRM and FC HBA firmware

1. Boot the Alpha SRM FW update CD from the SRM prompt.



NOTE:

Use Alpha SRM firmware update version 6.9 or later.

The following example uses `dqa0` as the CD drive designation:
`P00>>>b dqa0`

2. Enter the following once the CD boots and the UPD prompt appears:

`UPD>List`

The `list` command checks the current versions against the new versions of firmware.

3. Enter the following command to update the firmware versions:

`UPD>Update *`

4. Verify that the adapter and SRM firmware are updated using the following command:

`UPD>List`

Verifying Fibre Channel adapter software installation

A supported FCA should already be installed in the host server. To verify that OpenVMS recognizes the installed FCA, do the following:

1. Access the console.
2. Use the `SHOW DEVICE` command. The following is an example:
`P>>>SHOW DEVICE PG`

The following output is displayed:

`PGA0 WWPN 2000-0000-c921-1858`

`PGB0 WWPN 2000-0000-c921-18bd`

The response returned indicates that the FCA board is properly installed and functioning. The World Wide Port Name (WWPN) for each adapter is displayed.

HP StorageWorks Command View EVA and the Storage System Scripting utility

The Storage System Scripting utility (SSSU) is delivered as part of HP StorageWorks Command View EVA. The SSSU is a command line interface (CLI) that issues commands directly to the controller. You can locate HP StorageWorks Command View EVA including the SSSU at the following web site:
<http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html>.

Console LUN ID and OS unit ID

The Command View EVA software displays a field for the Console LUN ID on the Initialized Storage System Properties page.

It is very important that you set the Console LUN ID to a number other than zero. If the Console LUN ID is not set or is set to zero, the OpenVMS host will not see the controller pair. After the Console LUN ID is set for a controller pair, you do not have to concern yourself with it until another controller pair is introduced in the SAN. [Table 2](#) displays an example of the Console LUN ID.

The Command View EVA software displays a field for the OS Unit ID. This field is required for OpenVMS host machines.

This is an ID field that can be set on the virtual disk properties page. The default setting is 0, which disables the ID field. To enable the ID field, you must specify a value between 1 and 32767.



WARNING!

It is possible to enter a duplicate Console LUN ID or OS Unit ID number. You must ensure that the Console LUN ID and OS Unit ID number you enter does not duplicate one already in use. A duplicate Console LUN ID or OS Unit ID number could allow the OpenVMS hosts to corrupt data through confusion about LUN identity as well as have the host not see the controllers.

Table 2 Comparing console LUN to OS unit ID

ID type	System Display
Console LUN ID set to 100	\$1\$GGA100:
OS UNIT ID set to 50	\$1\$DGA50:

Working with clusters

Clustering is connecting two or more computers together in such a way that they behave like a single computer. Clustering is used for parallel processing, load balancing, and fault tolerance.

See the operating system-specific release notes for the latest versions of the supported clustering software.

You need to make the Console LUN ID and OS Unit IDs for OpenVMS hosts unique throughout the entire SAN, not just the controller subsystem.

2 Testing connections to the Enterprise Virtual Array

This chapter describes how to test connections between the operating system host server and the Enterprise Virtual Array. Virtual disks are set up and presented to your host server in order to test the connectivity and to begin using the disks. Topics in this chapter include the following:

- Adding hosts
- Creating and presenting virtual disks
- Verifying virtual disks from the host
- Configuring virtual disks from the host

Adding hosts

You can add a host using Command View EVA. You need to add each FCA installed in the host system in order for the host to work with the Enterprise Virtual Array by performing the following procedure:

1. Collect information on World Wide Names (WWNs) for each FCA on your server. You need this information when choosing the host FCAs in Command View EVA.



NOTE:

Adding hosts through the Command View EVA software consists of adding each FCA adapter installed in the host. When you add the first adapter, you use the Add Host function, but when you add subsequent adapters, you use the Add Port function. Ensure that you add a port for each active FCA.

2. Add the host using Command View EVA. Choose your host from the pull-down menu.
3. Ensure that the host FCAs have been added by inspecting the host folder in the navigation tree of Command View EVA.



NOTE:

For more information on using Command View EVA, refer to *HP StorageWorks Interactive Help for Command View EVA*.

Creating and presenting virtual disks

Use the following procedure to create and present additional virtual disks to the host servers:

1. Create a virtual disk on the Enterprise Virtual Array using Command View EVA.
2. Set values for the following parameters:
 - Virtual disk name
 - Vraid level
 - Size
 - Present to Host (the host you just created)

- Set the OS Unit ID located on the Virtual Disk Properties page to a unique value for each virtual disk.
The OS Unit ID must be unique across the entire SAN. It is displayed by viewing the output of a `SHOW DEVICE` command. The following example shows how a virtual disk with the OS Unit ID set to 50 is displayed:

```
Disk $1$DGA50
```

**CAUTION:**

The storage administrator needs to plan the OS Unit ID numbers in advance. Ensure that no duplicates are entered as more virtual disks are presented to OpenVMS hosts. A duplicate OS UNIT ID number can corrupt data through LUN identity confusion. Also ensure that the OS Unit ID number is a value between 1 and 32767. The host does not recognize a value set to zero.

3. Select a LUN number if you chose a specific LUN on the **Virtual Disk Properties** page.
4. Restart the server or rescan the bus by using the following command:

```
$ MC SYSMAN IO AUTO
```

Verifying virtual disks from the host

This section describes how to verify that operating system hosts can access the virtual disks created on the Enterprise Virtual Array with the Command View EVA. The host can recognize Enterprise Virtual Array devices either through a system restart or by rescanning the bus.

Scanning the bus

You scan the bus for the virtual disk and then display information about the Enterprise Virtual Array devices. After configuring the virtual disks through the Command View EVA, rescan the bus with the following command:

```
$ MC SYSMAN IO AUTO
```

**NOTE:**

The Enterprise Virtual Array console LUN can be seen without any virtual disks presented. The console LUN displays as `1GGAX` (where `x` represents the number of the console LUN ID on the controller).

The system scans the fabric for devices and then you can verify them with the following `SHOW DEVICE` command:

```
$ SHOW DEVICE NAME-OF-VIRTUAL-DISK/FULL
```

For example, to display device information on a virtual disk named `1DGA50`, use the following command:

```
$ SHOW DEVICE $1$DGA50:/FULL
```

The following output is displayed:

```
Disk $1$DGA50: (EIGHT), device type HSV110, is online, mounted, file-
oriented device, shareable, served to cluster via MSCP Server, errorlogging
is enabled.
```

```
Error count 0      Operations completed 96
Owner process "" Owner UIC [SYSTEM]
Owner process ID 00000000 Dev Prot S:RWPL,O:RWPL,G:R,W
Reference count 1 Default buffer size 512
Current preferred CPU Id 0 Fastpath 1
WWID 01000010:6005-08B4-0000-0020-0015-E000-0037-0000
Total blocks 10485760 Sectors per track 128
Total cylinders 640 Tracks per cylinder 128
Allocation class 1
```

```
I/O paths to device          4
Path PGB0.5000-1FE1-0013-A0B9 (EIGHT), primary path, current path.
Error count0      Operations completed19
Path PGB0.5000-1FE1-0013-A0BC (EIGHT).
Error count0      Operations completed19
Path PGE0.5000-1FE1-0013-A0B8 (EIGHT).
Error count0      Operations completed19
Path PGE0.5000-1FE1-0013-A0BD (EIGHT).
Error count0      Operations completed19
Volume label "E1DISK" Relative volume number 0
Cluster size 11 Transaction count 1
Free blocks 10485310 Maximum files allowed 436906
Extend quantity 5 Mount count 1
Mount status System Cache name "_$8$DKB200:XQPCACHE"
Extent cache size 64 Maximum blocks in extent cache 1048531
Quota cache size 0 Maximum buffers in FCP cache 690
Volume owner UIC [SYSTEM] Vol
Prot S:RWCD,O:RWCD,G:RWCD,W:RWCD
```

```
Volume Status: ODS-2, subject to mount
verification, file high-watermarking, write-back caching enabled.
```

You can also use `SHOW DEVICE` to display only the Fibre Channel (FC) virtual disks. The syntax for showing the FC virtual disks only follows:

```
$ SHOW DEVICE DG
```

The `$ SHOW DEVICE DG` command displays a list of all virtual disks presented to the OpenVMS system.



NOTE:

Restarting the host system shows any newly presented virtual disks because a hardware scan is performed as part of the startup.

If you are unable to access the virtual disk, check the following:

- Verify all cabling to the switch, Enterprise Virtual Array, and host.
- Verify all firmware levels (check the Enterprise Virtual Array QuickSpecs and associated release notes for details).
- Ensure that you are running a supported version of the host operating system and latest Engineering Change Order (ECO) kits.
- Check the SRM Console firmware on Alpha servers.
- Ensure that the correct host is selected for this virtual disk and that a unique OS Unit ID is used in the Command View EVA.
- Ensure that OpenVMS is selected as the operating system for the virtual disk in the Command View EVA.

Configuring virtual disks from the host

After you have set up the virtual disks on the Enterprise Virtual Array and have rescanned or restarted the host, you need to follow the host-specific conventions for configuring these new disk resources. Refer to the documentation that came with your server for specific instructions on setting up disk resources.

Disk configuration consists of initializing the virtual disk resource as follows:

1. Enter the following command to initialize the virtual disk:

```
INITIALIZE name-of-virtual-disk volume-label
```

2. Enter the following command to mount the disk:

```
MOUNT/SYSTEM name-of-virtual-disk volume-label
```



NOTE:

The `/SYSTEM` switch is used for a single stand-alone system. Use `/CLUSTER` for OpenVMS clusters.

3. View the virtual disk's information with the `SHOW DEVICE` command. For example, enter the following command sequence to configure a virtual disk named `data1` in a stand-alone environment:


```
$ INIT $1$DGA1: data1
$ MOUNT/SYSTEM $1$DGA1: data1
$ SHOW DEV $1$DGA1: /FULL
```

Setting preferred paths

You can set or change the preferred path used for a virtual disk by using the `SET DEVICE /PATH` command. For example:

```
$ SET DEVICE $1$DGA83: /PATH=PGA0.5000-1FE1-0007-9772/SWITCH
```

This allows you to control which path each virtual disk uses.

For additional information on using OpenVMS commands, see the OpenVMS help file:

```
$ HELP TOPIC
```

For example, the following command displays help information for the `MOUNT` command:

```
$ HELP MOUNT
```

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